Appl. No.:   09/652, 834
Amdt. dated June 4, 2004
Reply to Office action of March 31, 2004

REMARKS/ARGUMENTS

Applicants received the Office Action dated March 31, 2004, in which the Examiner rejected all pending claims (claims 1-16) as being obvious over Cherabuddi (U.S. Patent No. 6,496,917) in view of Arimilli (U.S. Patent No. 5,895,484). Applicants traverse the rejections for the following reasons and respectfully request reconsideration and allowance of the pending claims.

Applicants are confused by the arguments set forth in the Office Action. In paragraph 4 (pages 2-3), the Office Action seems to quote *verbatim* all of the language from claim 1 and conclude that all claim limitations are disclosed in Cherabuddi. In response to the previous Office Action, Applicants explained that Cherabuddi does not disclose all of the limitations in claim 1, as well as the other claims. Aside from the argument in paragraph 4, the Examiner seems to agree with Applicants' arguments in that the ground of rejection of the claims has changed from anticipation over Cherabuddi in the previous Office Action to obviousness over Cherabuddi in view of Arimilli in the current Office Action. In paragraph 5 of the current Office Action, the Examiner even states that Cherabuddi does not teach the claimed "directory." Thus, Applicants assume that, despite the argument set forth in paragraph 4 of the Office Action, the Examiner concedes that Cherabuddi does not disclose all of the limitations of claim 1. Clarification is respectfully requested if Applicants have misunderstood the current Office Action.

Cherabuddi does not disclose the claimed "coherence directory" nor does Cherabuddi disclose performing "a speculative write of the next directory state to the coherence directory for the data block without waiting for the Owner processor node to respond to the request." The Examiner turns to Arimilli to satisfy the deficiency of Cherabuddi.

The Background section of the Arimilli (col. 1) explains that, in a multi-processor system, when one processor requests data that is contained in the cache of another processor, the processor containing the requested data may have to wait before supplying the requested if another processor in the system is engaged in a "retry" operation. Arimilli solves this problem by beginning to

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"source" (i.e., to provide) the requested data before such data would otherwise be provided. The Examiner appears to argue that speculatively writing the next directory state as recited in claim 1 would be obvious given Arimilli's teaching of speculatively sourcing cache data in response to a request for such data.

Applicants respectfully disagree with the Examiner's analysis. Arimilli does not teach or even suggest speculatively writing the next directory state as recited in claim 1. Further, Arimilli appears to teach away from speculatively writing a coherency directory as claimed. Arimilli states that "if the combined coherency response is not a retry, the sourcing of the requested data will continue...until its completion. Finally, the status of the L2 cache in both the requesting processing unit and the intervening processing unit are updated accordingly." Col. 5, lines 48-52. Thus, Arimilli specifically teaches waiting until the requested data is provided before updating the coherency directory to reflect the new status of the cache data. As the Examiner is no doubt aware, providing (i.e., sourcing) cache data to a requestor of such data is a separate act from updating the directory to reflect the new cache state (e.g., shared, exclusive, etc.) associated with the data. At least for these reasons, claim 1 and associated dependent claims are patentable over Cherabuddi.

Claim 5 also requires a "speculative write of the next directory state to the coherence directory...without waiting for the second processor node to respond to the request." For at least the reasons articulated above regarding claim 1, claim 5 and associated dependent claims are allowable over Cherabuddi.

Claim 10 also requires a "speculative write of the next directory state to the coherence directory...without waiting for the Owner processor node to respond to the request." For at least the reasons articulated above regarding claim 1, claim 10 is allowable over Cherabuddi.

Claim 11 requires "receiving a request for a data block, forwarding the request to an owner node at which an updateable directory state of the data block is stored, and speculatively writing the directory state before receiving a coherence response from the owner." None of the art of record teaches or

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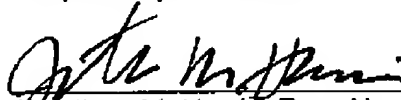Reply to Office action of March 31, 2004

suggests this combination of limitations.   Thus, claim 11 and associated dependent claims 12 and 13 are allowable over Cherabuddi.

Claim 14 requires "memory in which a directory table is stored, the directory table including an configurable cache state associated with the data block; and a cache controller that speculatively updates the data block's cache state in the directory table upon receiving a memory request and before the apparatus receives a coherence response from the owner node." None of the art of record teaches or suggests this combination of limitations. Thus, claim 14 and associated dependent claims 15 and 16 are allowable over Cherabuddi.

In the course of the foregoing discussions, Applicants may have at times referred to claim limitations in shorthand fashion, or may have focused on a particular claim element. This discussion should not be interpreted to mean that the other limitations can be ignored or dismissed. The claims must be viewed as a whole, and each limitation of the claims must be considered when determining the patentability of the claims. Moreover, it should be understood that there may be other distinctions between the claims and the prior art which have yet to be raised, but which may be raised in the future.

Applicants respectfully request that a timely Notice of Allowance be issued in this case. If any fees or time extensions are inadvertently omitted or if any fees have been overpaid, please appropriately charge or credit those fees to Hewlett-Packard Company Deposit Account Number 08-2025 and enter any time extension(s) necessary to prevent this case from being abandoned.

Respectfully submitted,

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